



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : A61M 15/00, 11/00		A1	(11) International Publication Number: WO 99/25406 (43) International Publication Date: 27 May 1999 (27.05.99)
(21) International Application Number: PCT/SE98/02038			(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
(22) International Filing Date: 11 November 1998 (11.11.98)			
(30) Priority Data: 9704185-9 14 November 1997 (14.11.97) SE			
(71) Applicant (for all designated States except MG US): ASTRA PHARMACEUTICALS LTD. [GB/GB]; Home Park, Kings Langley, Herts WD4 8DH (GB).			
(71) Applicant (for MG only): ASTRA AKTIEBOLAG [SE/SE]; S-151 85 Söderälje (SE).			
(72) Inventors; and			Published
(75) Inventors/Applicants (for US only): HODSON, Darren [GB/GB]; Astra Charnwood, Bakewell Road, Loughborough, Leics LE11 5RH (GB). RASMUSSEN, Jørgen [DK/DK]; Bang & Olufsen Technology a/s, Bødkervej 2, DK-7600 Struer (DK).			With international search report.
(74) Agent: ASTRA AKTIEBOLAG; Patent Dept., S-151 85 Söderälje (SE).			
(54) Title: INHALATION DEVICE			
(57) Abstract			
<p>An actuator for an inhaler for delivering medicament by inhalation, comprising: a main body (2) comprising a tubular member (8) for receiving a canister (7) containing medicament and having a valve stem (11) extending therefrom; and an outlet assembly (4), as a part formed separately of the main body (2), comprising a mouthpiece for guiding medicament to the mouth of a user and a nozzle block (20) for receiving the valve stem (11) of the canister (7) and delivering medicament from the canister (7) into the mouthpiece; wherein at least a part of at least one of the main body (2) and the outlet assembly (4) is configured so as to deform or break on separating the outlet assembly (4) from the main body (2) so as to prevent re-use of the actuator; characterized in that the main body (2) and the outlet assembly (4) are composed of materials having different constitution.</p>			

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP'	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	KZ	Kazakhstan	RU	Russian Federation		
CZ	Czech Republic	LC	Saint Lucia	SD	Sudan		
DE	Germany	LI	Liechtenstein	SE	Sweden		
DK	Denmark	LK	Sri Lanka	SG	Singapore		
EE	Estonia	LR	Liberia				

INHALATION DEVICE

The present invention relates to an actuator for an inhaler for administering medicament by inhalation and to an inhaler including the same.

5

For some time, actuators have been known for delivering metered doses of medicament from aerosol canisters. These actuators comprise a single integral moulding and are usually coloured to identify the medicament being delivered. After use with only one canister the actuator is discarded. This is desirable, since some medicaments which are delivered, will, over time, become deposited in the nozzle block and the mouthpiece of the actuator.

10 It is an aim of the present invention to provide an actuator of two-part construction, with the parts being composed of materials having different constitution and configured so as not to be separable without being deformed or broken. Such two-part construction prevents re-use of the actuator, thereby ensuring that the actuator has to be thrown away after use with a single canister, and further allows for the manufacture of a range of actuators by providing the first part as a common part to the range and forming the second part from a material having different constitution and optionally any shape. Typically, the 15 second part can be coloured or have a particular surface finish or decoration according to the medicament to be delivered. In addition, the second part can be formed to have a particular shape, such as that of an animal which may appeal to young children. Such two-part construction is also advantageous for preparing regulatory documentation which will 20 include common data relating to the first part.

25

25 US-A-5520166 discloses a cassette for use in an aerosol delivery device. The cassette comprises, as separate parts, a mouthpiece and a housing to one end of which the mouthpiece is attached, but, in being intended to be located within another device, there is no requirement and no suggestion is made of forming the parts of the cassette of materials 30 having different constitution.

Accordingly, the present invention provides an actuator for an inhaler for delivering medicament by inhalation, comprising: a main body comprising a tubular member for receiving a canister containing medicament and having a valve stem extending therefrom;

- 5 and an outlet assembly, as a part formed separately of the main body, comprising a mouthpiece for guiding medicament to the mouth of a user and a nozzle block for receiving the valve stem of the canister and delivering medicament from the canister into the mouthpiece; wherein at least a part of at least one of the main body and the outlet assembly is configured so as to deform or break on separating the outlet assembly from the main
- 10 body so as to prevent re-use of the actuator; characterized in that the main body and the outlet assembly are composed of materials having different constitution.

Preferably, the tubular member includes a lateral opening at one end thereof for receiving the outlet assembly at an angle transverse to the length thereof.

15

Preferably, the tubular member includes an opening at one end thereof through which a canister is in use fitted.

- 20 Preferably, the main body further comprises a foot at one end of the tubular member thereof which is configured such that, with a canister fitted therein, the actuator will stand unsupported with the tubular member extending generally vertically.

In one embodiment the bottom surface of the foot includes a recess for receiving a thumb or a finger of a user. Preferably, the recess is concave.

25

In another embodiment the bottom surface of the foot is flat.

Preferably, the actuator further comprises a breath actuation mechanism.

Preferably, the actuator further comprises a compliance monitor, in particular a dose counter.

5 In a preferred embodiment the main body comprises one or both of the breath actuation mechanism and the compliance monitor.

In a particularly preferred embodiment the foot comprises one or both of the breath actuation mechanism and the compliance monitor.

10 Preferably, the outlet assembly is formed as a single integral moulding.

Preferably, the nozzle block includes a bore having an opening for receiving the valve stem of a canister and a spray orifice configured to direct a spray into the mouthpiece.

15 Preferably, the outlet assembly is configured to deform or be broken in being separated from the main body.

In a preferred embodiment a connection between the mouthpiece and the nozzle block is configured at least in part to break on separating the outlet assembly from the main body.

20 In a particularly preferred embodiment the connection between the mouthpiece and the nozzle block comprises at least one member connecting a lower part of the mouthpiece with a lower part of the nozzle block and at least one member connecting an upper part of the mouthpiece with an upper part of the nozzle block, with the at least one member connecting a lower part of the mouthpiece with a lower part of the nozzle block being configured to break on separating the outlet assembly from the main body.

25 Preferably, the main body and the outlet assembly are configured so as to snap-fit together.

In one embodiment the main body and the outlet assembly are composed of entirely different materials.

In another embodiment the main body and the outlet assembly are composed of the same 5 basic material but include different additives such as colour pigment.

In a particularly preferred embodiment the main body and the outlet assembly are of different colour.

10 The present invention also extends to an inhaler comprising the above-described actuator and a canister containing medicament.

Preferably, the inhaler is a pressurised metered dose inhaler.

15 A preferred embodiment of the present invention will now be described hereinbelow by way of example only with reference to the accompanying drawings, in which:

Figure 1 illustrates a perspective view of an inhaler in accordance with a preferred embodiment of the present invention;

20

Figure 2 illustrates a side view of the inhaler of Figure 1;

Figure 3 illustrates a front view of the inhaler of Figure 1;

25 Figure 4 illustrates a rear view of the inhaler of Figure 1;

Figure 5 illustrates a plan view of the inhaler of Figure 1;

Figure 6 illustrates an underneath plan view of the inhaler of Figure 1;

Figure 7 illustrates a horizontal sectional view (along section A-A) of the inhaler of Figure 1;

5 Figure 8 illustrates in enlarged scale a fragmentary view of the section illustrated in Figure 7;

Figure 9 illustrates a vertical sectional view (along section B-B) of the inhaler of Figure 1;

10 Figure 10 illustrates in enlarged scale a fragmentary view of the section illustrated in Figure 9;

Figure 11 illustrates a perspective view of the outlet assembly of the actuator of the inhaler of Figure 1;

15 Figure 12 illustrates a plan view of the outlet assembly of Figure 11;

Figure 13 illustrates an underneath plan view of the outlet assembly of Figure 11;

Figure 14 illustrates a side view of the outlet assembly of Figure 11;

20 Figure 15 illustrates a rear view of the outlet assembly of Figure 11; and

Figure 16 illustrates a front view of the outlet assembly of Figure 11.

25 The inhaler comprises an actuator, which comprises a main body 2, an outlet assembly 4 fitted to a lower part of the main body 2 and a cap 6, and an aerosol canister 7 containing medicament fitted therein.

30 The main body 2 comprises a tubular member 8 having an opening 10 at one, the upper end thereof into which a canister 7 having a valve stem 11 extending therefrom is in use

fitted, and a foot 12 having a bottom surface which includes a recess 12a, in this embodiment concave in shape, for receiving typically a thumb of a user. In an alternative embodiment the foot 12 can be formed with a substantially flat bottom surface. The foot 12 serves to allow the actuator to stand unsupported on a flat surface such that, when the 5 actuator is not in use, it can be stored in an upright position. This is particularly advantageous when an a canister 7 is fitted therein, since such canisters 7 should, ideally, be stored with the valve stem 11 directed downwards. The other, lower, end of the tubular member 8 is closed and includes a lateral opening 14, in this embodiment ovoid in shape, into which the outlet assembly 4 is fitted.

10

The main body 2 further comprises a pair of opposing projections 16 which extend inwardly from the inner surface of the tubular member 8 adjacent the lateral opening 14. The projections 16 are disposed to the sides of the lateral opening 14 and are spaced rearwardly therefrom.

15

The outlet assembly 4 comprises a tubular section 18, a major part of which defines the mouthpiece which is in use gripped by the lips of a user, and a nozzle block 20 connected thereto.

20

The tubular section 18 includes a radial outwardly-directed peripheral flange 22. When the outlet assembly 4 is inserted fully into the main body 2, the flange 22 abuts the lateral opening 14 such that the major part of the tubular section 18 extends outwardly of the main body 2.

25

The outlet assembly 4 further comprises first and second arms 24, 26 which extend rearwardly from respective sides of the tubular section 18. Each of the first and second arms 24, 26 includes a catch member 28, 30 which is adapted to engage with a respective one of the projections 16 on the inner surface of the tubular member 8 when the outlet assembly 4 is inserted fully into the main body 2. The catch members 28, 30 on the first 30 and second arms 24, 26 each include a first surface 28a, 30a which has a rearwardly-

directed component and acts as a guiding surface, and a second surface 28b, 30b which is substantially orthogonally directed to the longitudinal axis of the outlet assembly 4 and acts as a locking surface.

- 5 The outlet assembly 4 further comprises a third arm 34 which extends rearwardly from the top of the tubular section 18. The third arm 34 includes a catch member 35 in the form of an outwardly-directed projection, which, when the outlet assembly 4 is inserted fully into the main body 2, engages behind a part of the tubular member 8 defining the lateral opening 14. The catch member 35 on the third arm 34, as with the catch members 28, 30
- 10 on the first and second arms 24, 26, includes a first surface 35a which has a rearwardly-directed component and acts as a guiding surface, and a second surface 35b which is substantially orthogonally directed to the longitudinal axis of the outlet assembly 4 and acts as a locking surface.
- 15 The nozzle block 20 is connected to the tubular section 18 by first and second pairs of connecting elements 36, 38. The first pair of connecting elements 36 extend between a lower part of the nozzle block 20 and a lower part of the tubular section 18. As will be described hereinbelow, in this embodiment the lower connecting elements 36 are configured to break or be permanently deformed on withdrawal of the outlet assembly 4
- 20 from the main body 2. The second pair of connecting elements 38 extend between an upper part of the nozzle block 20 and an upper part of the tubular section 18. The nozzle block 20 includes a tubular bore 40 which extends along the longitudinal axis of the tubular member 8 when the outlet assembly 4 is inserted fully into the main body 2. The tubular bore 40 is open at one, the upper, end and includes a laterally-directed spray orifice 42 at
- 25 the other, lower, end. The spray orifice 42 is configured to direct a spray into the tubular section 18. In this embodiment the tubular bore 40 is adapted to receive the valve stem 11 of a canister 7.

The outlet assembly 4 further comprises a fourth arm 44 which extends forwardly and

- 30 downwardly from the nozzle block 20. The distal end of the fourth arm 44 includes a catch

member 46 which, when the outlet assembly 4 is inserted fully into the main body 2, engages behind a part of the tubular member 8 defining the lateral opening 14. The catch member 46 on the fourth arm 44 includes a surface 46a which is substantially orthogonally directed to the longitudinal axis of the outlet assembly 4 and acts as a locking surface.

5

In manufacture, an outlet assembly 4 and a main body 2 are selected according to the requirements, based on colour, shape, etc., for the actuator. The outlet assembly 4 is then inserted into the lateral opening 14 in the main body 2 until the catch members 28, 30 on the first and second arms 24, 26 of the outlet assembly 4 engage with the respective 10 projections 16 on the inner side surface of the tubular member 8 of the main body 2, and the catch members 34, 46 on the third and fourth arms 34, 44 of the outlet assembly 4 engage behind respective parts of the tubular member 8 defining the lateral opening 14. A canister 7 is then passed into the tubular member 8 of the main body 2 through the upper opening 10 such that the valve stem 11 of the canister 7 is located in the tubular bore 40 in 15 the nozzle block 20. The inhaler is then ready for use.

By the provision of catch members the outlet assembly 4 is held in the main body 2 and the outlet assembly 4 cannot be non-destructably detached from the main body 2. As mentioned hereinabove, the outlet assembly 4 is configured to break or be permanently 20 deformed if withdrawn from the main body 2 and thereby render the outlet assembly 4 and hence the actuator unusable. In this embodiment this is achieved by configuring the lower connecting elements 36 connecting the tubular section 18 and the nozzle block 20 of the outlet assembly 4 to break or be permanently deformed on withdrawal of the outlet assembly 4 from the main body 2.

25

Finally, it will be understood by a person skilled in the art that the present invention is not limited to the described embodiment but can be modified in many different ways within the scope of the appended claims.

CLAIMS

1. An actuator for an inhaler for delivering medicament by inhalation, comprising:
5 a main body (2) comprising a tubular member (8) for receiving a canister (7) containing medicament and having a valve stem (11) extending therefrom; and an outlet assembly (4), as a part formed separately of the main body (2), comprising a mouthpiece for guiding medicament to the mouth of a user and a nozzle block (20) for receiving the valve stem (11) of the canister (7) and delivering medicament from the canister (7) into the mouthpiece;
10 wherein at least a part of at least one of the main body (2) and the outlet assembly (4) is configured so as to deform or break on separating the outlet assembly (4) from the main body (2) so as to prevent re-use of the actuator; characterized in that the main body (2) and the outlet assembly (4) are composed of materials having different constitution.
- 15 2. The actuator according to claim 1, wherein the tubular member (8) includes a lateral opening (14) at one end thereof for receiving the outlet assembly (4) at an angle transverse to the length thereof.
- 20 3. The actuator according to claim 1 or 2, wherein the tubular member (8) includes an opening (10) at one end thereof through which a canister (7) is in use fitted.
4. The actuator according to any of claims 1 to 3, wherein the main body (2) further comprises a foot (12) at one end of the tubular member (8) thereof which is configured 25 such that, with a canister (7) fitted therein, the actuator will stand unsupported with the tubular member (8) extending generally vertically.
5. The actuator according to claim 4, wherein the bottom surface of the foot (12) includes a recess (12a) for receiving a thumb or a finger of a user.

6. The actuator according to claim 5, wherein the recess (12a) is concave.
7. The actuator according to claim 4, wherein the bottom surface of the foot (12) is flat.
8. The actuator according to any of claims 1 to 7, further comprising a breath actuation mechanism.
9. The actuator according to any of claims 1 to 8, further comprising a compliance monitor, in particular a dose counter.

10

10. The actuator according to claim 8 or 9, wherein the main body (2) comprises one or both of the breath actuation mechanism and the compliance monitor.
11. The actuator according to claim 10 when appendant upon any of claims 4 to 7, wherein the foot (12) comprises one or both of the breath actuation mechanism and the compliance monitor.
12. The actuator according to any of claims 1 to 11, wherein the outlet assembly (4) is formed as a single integral moulding.
13. The actuator according to any of claims 1 to 12, wherein the nozzle block (20) includes a bore (40) having an opening for receiving the valve stem (11) of a canister (7) and a spray orifice (42) configured to direct a spray into the mouthpiece.
14. The actuator according to any of claims 1 to 13, wherein the outlet assembly (4) is configured to deform or be broken in being separated from the main body (2).
15. The actuator according to claim 14, wherein a connection between the mouthpiece and the nozzle block (20) is configured at least in part to break on separating the outlet assembly (4) from the main body (2).

30

16. The actuator according to claim 15, wherein the connection between the mouthpiece and the nozzle block (20) comprises at least one member (36) connecting a lower part of the mouthpiece with a lower part of the nozzle block (20) and at least one member (38) connecting an upper part of the mouthpiece with an upper part of the nozzle block (20), with the at least one member (36) connecting a lower part of the mouthpiece with a lower part of the nozzle block (20) being configured to break on separating the outlet assembly (4) from the main body (2).
5
17. The actuator according to any of claims 1 to 16, wherein the main body (2) and the outlet assembly (4) are configured so as to snap-fit together.
10
18. The actuator according to any of claims 1 to 17, wherein the main body (2) and the outlet assembly (4) are of different colour.
15
19. An inhaler comprising the actuator according to any of claims 1 to 18 and a canister (7) containing medicament.
20
20. The inhaler according to claim 19, wherein the inhaler is a pressurised metered dose inhaler.

1/5

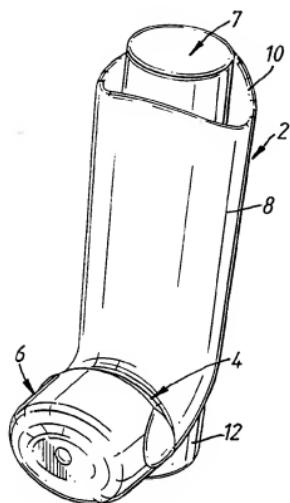


Fig. 1

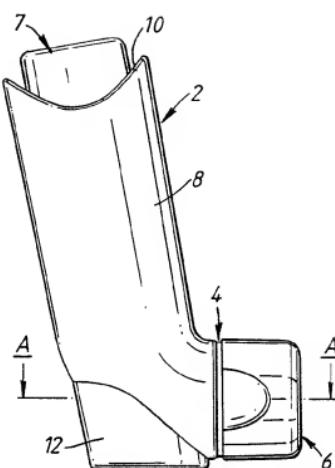


Fig. 2

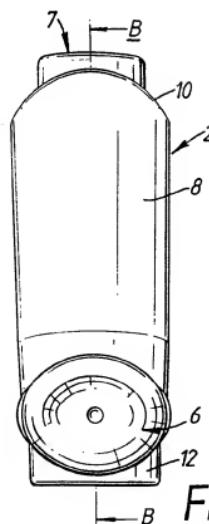


Fig. 3

2/5

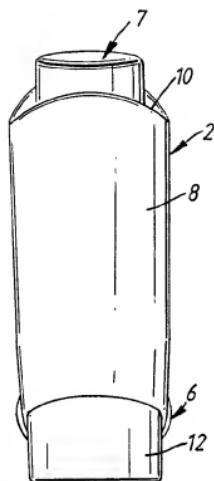


Fig.4

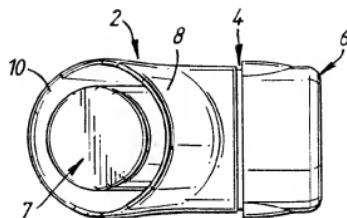


Fig.5

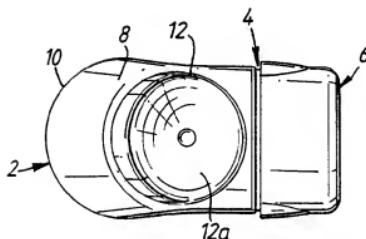


Fig.6

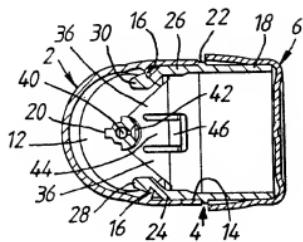


Fig.7

3/5

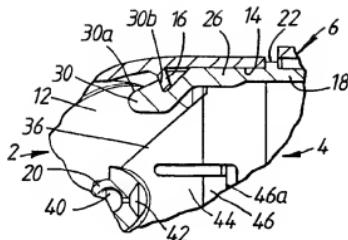


Fig. 8

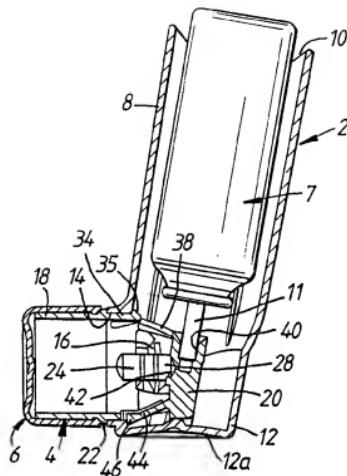


Fig. 9

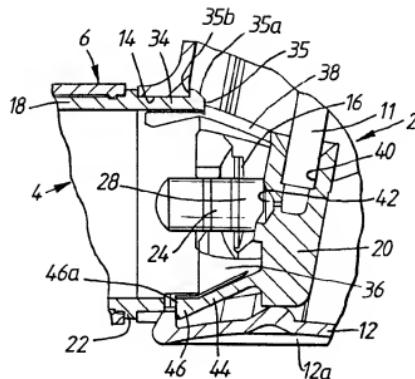


Fig. 10

SUBSTITUTE SHEET (RULE 26)

4/5

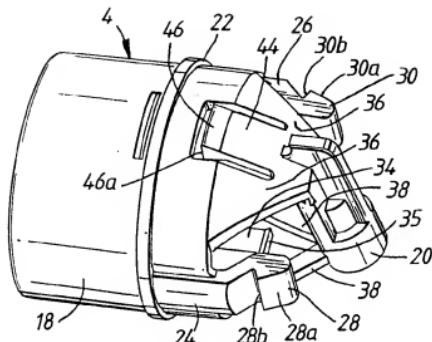


Fig. 11

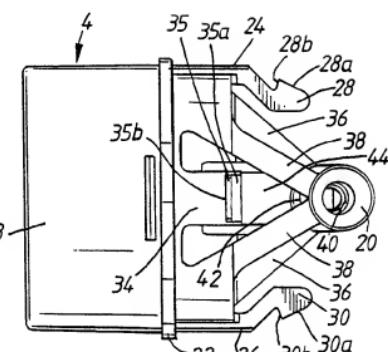


Fig. 12

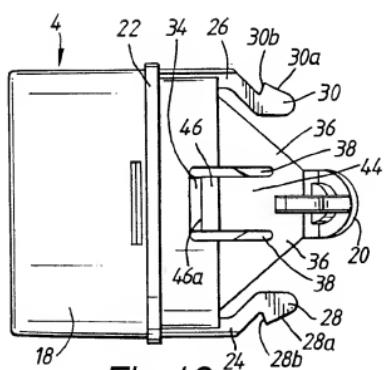


Fig. 13

5/5

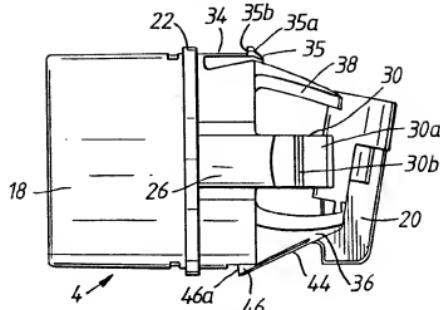


Fig. 14

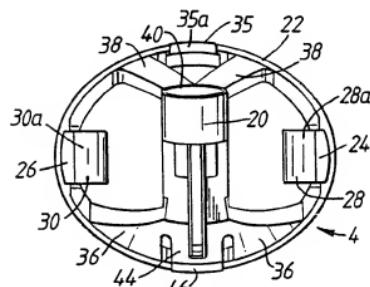


Fig. 15

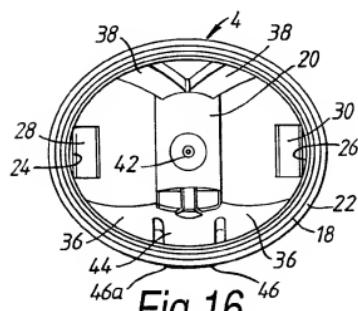


Fig. 16

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 98/02038

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A61M 15/00, A61M 11/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5520166 A (CARL RITSON ET AL), 28 May 1996 (28.05.96), column 8, line 35 - line 63, figures 4-5	1
A	---	2-20
A	WO 9507723 A1 (MEDTRAC TECHNOLOGIES INC.), 23 March 1995 (23.03.95), page 8, line 4 - line 22, figures 1-3	1-20
A	---	
A	US 3739950 A (JOHN F. GORMAN), 19 June 1973 (19.06.73), column 2, line 34 - line 37	1-20

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"O" document referring to an oral disclosure, use, exhibition or other means

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"P" document published prior to the international filing date but later than the priority date claimed

"A" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

09-03-1999

2 March 1999

Name and mailing address of the ISA /
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. + 46 8 666 02 86

Authorized officer

Håkan Sandh

Telephone No. + 46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 98/02038

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category ¹	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4641644 A (JAN A.R.ANDERSSON ET AL), 10 February 1987 (10.02.87), column 3, line 2 - line 12	1-20

INTERNATIONAL SEARCH REPORT

Information on patent family members

02/02/99

International application No.

PCT/SE 98/02038

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US 5520166 A	28/05/96	US 5497764 A		12/03/96
		CA 2082168 C		26/03/96
		EP 0529053 A		03/03/93
		JP 2613347 B		28/05/97
		JP 9164205 A		24/06/97
		US 5392768 A		28/02/95
		US 5394866 A		07/03/95
		US 5404871 A		11/04/95
		US 5450336 A		12/09/95
		US 5469750 A		28/11/95
		US 5522378 A		04/06/96
		US 5542410 A		06/08/96
		US 5608647 A		04/03/97
		US 5622162 A		22/04/97
		US 5655516 A		12/08/97
		US 5743252 A		28/04/98
		US 5755218 A		26/05/98
		US 5813397 A		29/09/98
		US 5826570 A		27/10/98
		WO 9215353 A		17/09/92

WO 9507723 A1	23/03/95	NONE		

US 3739950 A	19/06/73	CA 991130 A		15/06/76
		GB 1389324 A		03/04/75

US 4641644 A	10/02/87	AT 12353 T		15/04/85
		AU 550712 B		10/04/86
		AU 8818682 A		22/03/84
		CA 1181643 A		29/01/85
		CY 1387 A		18/12/87
		DK 409082 A		16/03/83
		EP 0074937 A,B		23/03/83
		SE 0074937 T3		
		FI 72878 B,C		30/04/87
		FI 823121 A		16/03/83
		GR 77340 A		11/09/84
		HK 68687 A		02/10/87
		IE 53135 B		06/07/88
		JP 1058992 B		14/12/89
		JP 1573889 C		20/08/90
		JP 58061756 A		12/04/83
		PT 75558 B		18/11/85
		SE 433443 B,C		28/05/84
		SE 8105487 A		16/03/83
		ZA 8204880 A		27/04/83
